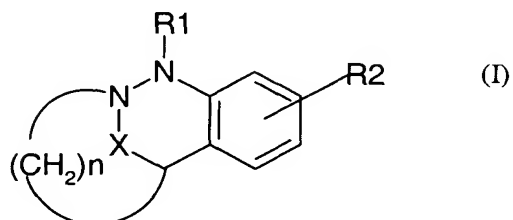


WHAT IS CLAIMED IS:

1. A compound of formula (I), or a pharmaceutically acceptable salt thereof with a base or acid:

5



in which:

10 n is 1 or 2;

R₁ is selected from the group consisting of hydrogen, alkyl having up to 8 carbon atoms and (CH₂)_nR°₁ in which n' is 0 or 1 and R°₁ is selected from the group consisting of aryl having up to 12 carbon atoms; heteroaryl having up to 15 carbon atoms and at least one
 15 heteroatom selected from N, S, and O; COR'; CONR'R"; CSNR'R"; COCOOR'; SO₂NR'R"; SO₂R'; CO₂R' and CN;

R' is selected from the group consisting of hydrogen, alkyl having up to 8 carbon atoms, alkenyl having up to 8 carbon atoms, aralkyl having up to 12 carbon atoms and aryl having
 20 up to 12 carbon atoms;

R'' is selected from the group consisting of hydrogen; alkyl having up to 8 carbon atoms; aryl having up to 12 carbon atoms; aralkyl having up to 12 carbon atoms; SO₂-R' and COR' ; in each case R' being independently selected from the group consisting of
 25 hydrogen, alkyl having up to 8 carbon atoms, alkenyl having up to 8 carbon atoms, aralkyl having up to 12 carbon atoms and aryl having up to 12 carbon atoms;

R₂ is selected from the group consisting of hydrogen, halo, alkyl, OH, Oalkyl, NO₂, NH₂, NHalkyl, N(alkyl)₂, NHCOalkyl, NHSO₂alkyl, CONHalkyl, SO₂NHalkyl, COOH, COOalkyl, CN, OSO₂alkyl, NHCONHalkyl and COalkyl; said alkyl having up to 8 carbon
 30 atoms;

X is a divalent group -C(O)-N(OR₃)- connected to the ring nitrogen atom via its carbonyl carbon atom and to the ring carbon atom via its nitrogen atom, in which R₃ is selected
 35 from the group consisting of hydrogen and the R, Y, Y₁, Y₂ and Y₃ moieties defined below;

R is selected from the group consisting of alkyl having up to 6 carbon atoms, optionally substituted by pyridyl or carbamoyl; alkenyl having up to 8 carbon atoms; aryl having up to 12 carbon atoms; and aralkyl having up to 12 carbon atoms; each said aryl group
 5 optionally being substituted by an -OH, -NH₂, -NO₂, alkyl having up to 8 carbon atoms, an alkoxy having up to 8 carbon atoms or by one or more halogens;

Y is selected from the group consisting of COR, COOH, COOR, CONHR, CONHOH, CONHSO₂R, CH₂COOH, CH₂COOR, CH₂CONHOH, CH₂CONHCN, CH₂tetrazole,
 10 CH₂(protected tetrazole), CH₂SO₃H, CH₂SO₂R, CH₂PO(OR)₂, CH₂PO(OR)(OH), CH₂PO(R)(OH) and CH₂PO(OH)₂, wherein R is as defined hereinabove;

Y₁ is selected from the group consisting of SO₂R, SO₂NHCOR, SO₂NHCOOR, SO₂NHCONHR and SO₃H, wherein R is as defined hereinabove;

15 Y₂ is selected from the group consisting of PO(OH)₂, PO(OR)₂, PO(OH)(OR) and PO(OH)(R), wherein R is as defined hereinabove;

Y₃ is selected from the group consisting of tetrazole, tetrazole substituted by R, squarate, NRtetrazole, NRtetrazole substituted by R, and NRSO₂R, wherein R is as defined above, including the pure enantiomers thereof, in the R, S or RS configuration, as well as any
 20 racemic mixture of said enantiomers.

2) A compound as claimed in claim 1, wherein n is 1.

25 3) A compound as claimed in claim 1, wherein R₂ is hydrogen.

4) A compound as claimed in claim 1, wherein R₁ is hydrogen, alkyl having up to 8 carbon atoms or (CH₂)_nR^o₁ wherein n' is 0 or 1 and R^o₁ is aryl having up to 12 carbon atoms; heteroaryl having up to 15 carbon atoms and at least one heteroatom selected from N, S, and O; CONR'R"; CSNR'R"; COCOOR'; SO₂NR'R"; SO₂R' or CO₂R'; R' and R"
 30 being as defined in claim 1.

5) A compound as claimed in claim 1, wherein X is a divalent group -C(O)-N(OR₃)- in which R₃ is selected from the group consisting of hydrogen and the R, Y and Y₁ radicals, R, Y and Y₁ being as defined in claim 1.

35

6) A compound of formula (I) as defined in claim 1, selected from the group consisting of:

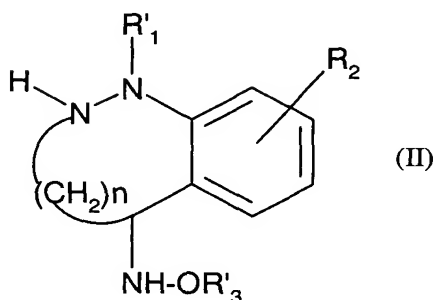
- [[1,5-dihydro-1-(methylsulfonyl)-3-oxo-2,5-methano-2*H*-1,2,4-benzotriazepin-4(3*H*)-yl]oxy]acetic acid,

- [[1-[(benzoylamino)carbonyl]-1,5-dihydro-3-oxo-2,5-methano-2*H*-1,2,4-benzotriazepin-4(3*H*)-yl]oxy]acetic acid,
- [[1,5-dihydro-3-oxo-1-[(phenylsulfonyl)aminocarbonyl]-2,5-methano-2*H*-1,2,4-benzotriazepin-4(3*H*)-yl]oxy]acetic acid,
- 5 - [(1,5-dihydro-3-oxo-2,5-methano-2*H*-1,2,4-benzotriazepin-4(3*H*)-yl]oxy]acetic acid,
- 4,5-dihydro-1-methyl-4-(sulfooxy)-2,5-methano-2*H*-1,2,4-benzotriazepin-3(1*H*)-one,
- 4,5-dihydro-4-(2-propenyloxy)-1-(3-pyridinylmethyl)-2,5-methano-2*H*-1,2,4-benzotriazepin-3(1*H*)one,
- 10 - 4,5-dihydro-3-oxo-*N*-(phenylsulfonyl)-4-(2-propenyloxy)-2,5-methano-2*H*-1,2,4-benzotriazepine-1(3*H*)-carboxamide,
- *N*-benzoyl-4,5-dihydro-3-oxo-4-(2-propenyloxy)-2,5-methano-2*H*-1,2,4-benzotriazepine-1(3*H*)-carboxamide,
- 15 - ethyl 4,5-dihydro- α ,3-dioxo-4-(2-propenyloxy)-2,5-methano-2*H*-1,2,4-benzotriazepine-1(3*H*)-acetate,
- ethyl 4,5-dihydro-3-oxo-4-(sulfooxy)-2,5-methano-2*H*-1,2,4-benzotriazepine-1(3*H*)-acetate,

and their salts and enantiomers as defined in claim 1.

7) A process for the preparation of a compound as claimed in claim 1, which process comprises:

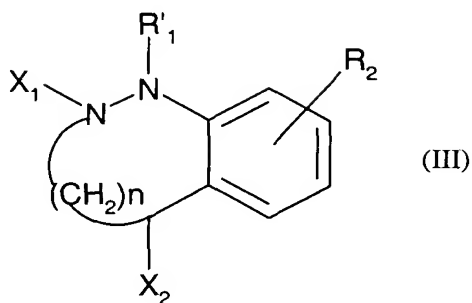
a) a first stage during which a compound of formula (II):



in which:

R'_1 is R_1 or a precursor thereof, R_2 and n are as defined in claim 1 and R'_3 is selected from the group consisting of a protective group for hydroxyl, R_p , Y_p , Y_{1p} , Y_{2p} and Y_{3p} , which, respectively, correspond to R , Y , Y_1 , Y_2 and Y_3 as defined in claim 1, in which the possible reactive functional groups present are, if appropriate, protected, is reacted with a carbonylating agent, if appropriate in the presence of a base, for the purpose of obtaining an intermediate compound of formula (III):

30



in which:

- R'₁, R₂ and n are as defined above and either (1) X₁ is hydrogen and X₂ represents an -N(OR'₃)-CO-X₃ group, wherein R'₃ is as defined above and X₃ is the residue of the carbonylating agent, or (2) X₂ is -NH-OR'₃ and X₁ is CO-X₃ group, X₃ being as defined above; and
- b) a second stage during which the intermediate of formula III obtained above is cyclized, in the presence of a base.
- 8) The process of claim 7 further comprising, either before stage a) or after stage b), as appropriate:
- c) one or more of the following reactions, in an appropriate order:
- protection of the reactive functional groups,
 - deprotection of the reactive functional groups,
 - esterification,
 - saponification,
 - sulfonation,
 - phosphatation,
 - amidation,
 - acylation,
 - sulfonylation,
 - alkylation,
 - formation of a urea group,
 - introduction of a tetrazole group,
 - reduction of carboxylic acids,
 - dehydration of amide to nitrile,
 - salification,
 - exchange of ions,
 - separation of enantiomers,
 - nitration,
 - reduction of a nitro to an amino,
 - halogenation,
 - carbamoylation,
 - introduction of a cyano group.

9) The process as claimed in claim 7, wherein the carbonylating agent is selected from the group consisting of phosgene, diphosgene, triphosgene, aryl, aralkyl, alkyl and alkenyl chloroformates, alkyl dicarbonates, carbonyldiimidazole and their mixtures.

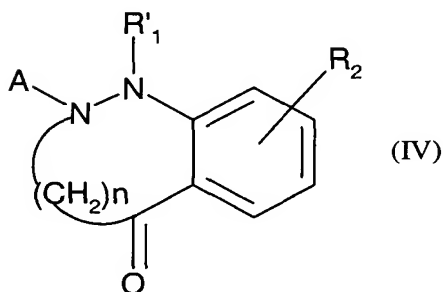
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10) The process as claimed in claim 7, wherein the carbonylation reaction takes place in the presence of a base.

11) The process as claimed in claim 7, wherein, in stage b), the base is selected from the group consisting of amines, alkali metal hydrides, alkoxides, amides and carbonates and alkaline earth metal hydrides, alkoxides, amides and carbonates.

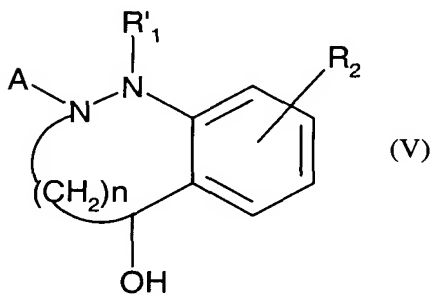
12) The process as claimed in claim 11, wherein the base is an amine.

13) The process as claimed in claim 7, wherein the compound of formula (II) is obtained by a process wherein a compound of formula (IV):



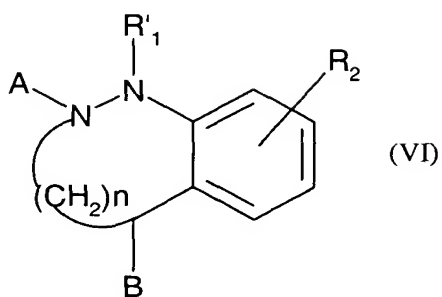
in which R'_1 , R_2 and n are as defined in claim 7 and A is hydrogen or a protective group for the nitrogen, is treated with a reducing agent, to obtain a compound of formula (V):

20



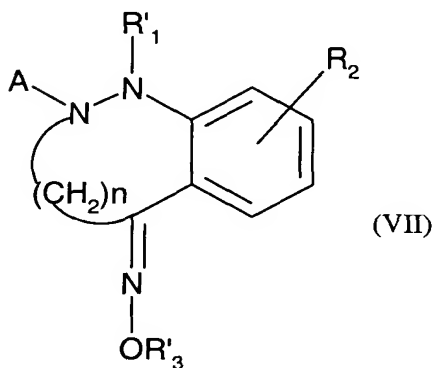
in which A , R'_1 , R_2 and n are as defined above, and in which process, if appropriate, the OH group is replaced by a leaving group, to obtain a compound of formula (VI):

25

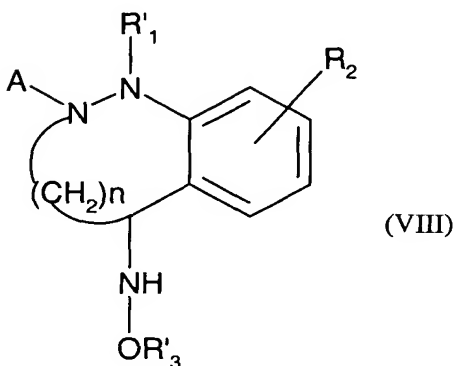


in which A, R', R₂ and n are as defined above and B represents a leaving group, which compound of formula VI is then treated with a compound of formula NH₂-OR'₃, R'₃ being
 5 as defined in claim 7, and then, if appropriate, with an appropriate deprotecting agent for the nitrogen atom.

14) The process as claimed in claim 7, wherein the compound of formula (II) is obtained by a process wherein a compound of formula (IV) as defined in claim 13 is
 10 treated with a compound of formula H₂N-OR'₃, to obtain a compound of formula (VII):



in which A is as defined in claim 13 and R', R₂, n and R'₃ are as defined in claim 7,
 15 which compound of formula VII is then reacted with a reducing agent, to obtain a compound of formula (VIII):



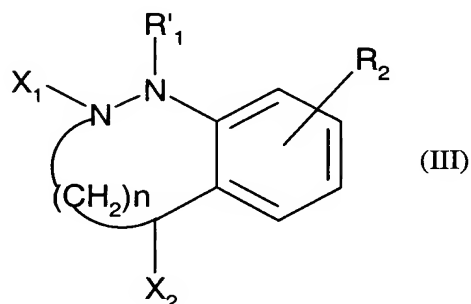
in which A, R'₁, R₂, n and R'₃ are as defined above, which compound of formula VIII is then treated, if appropriate, with an appropriate deprotecting agent for the nitrogen atom.

15) As a medicament, a product as defined in claim 1 in combination with a
5 pharmaceutically acceptable carrier.

16) As a medicament, a product as defined in claim 6 in combination with a
pharmaceutically acceptable carrier.

10

17) A compound of general formula (III) or one of its salts with an acid, in particular its hydrochloride and its trifluoroacetate:

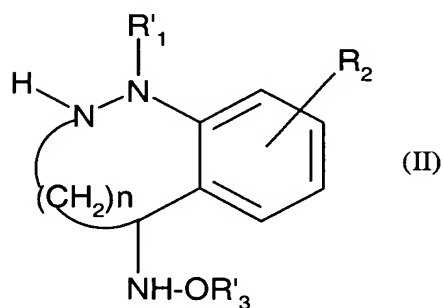


15 in which:

R'₁, R₂, X₁, X₂ and n have the same meanings as in claim 7.

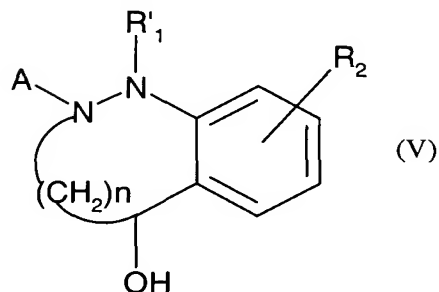
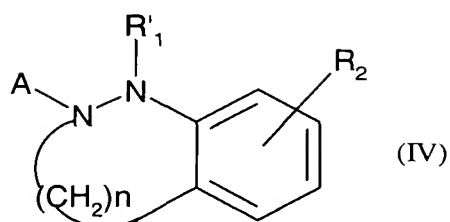
18) A compound of general formula (II) or one of its salts with an acid, in particular its hydrochloride and its trifluoroacetate:

20



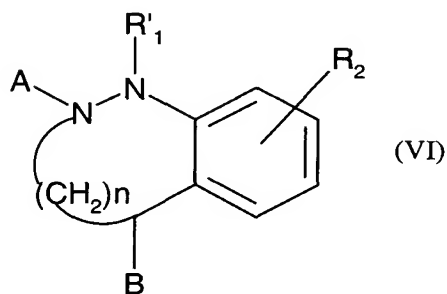
in which R'₁, R₂, R'₃ and n have the same meanings as in claim 7.

19) A compound selected from the compounds of formulas (IV) and (V) or a salt
25 thereof with an acid:



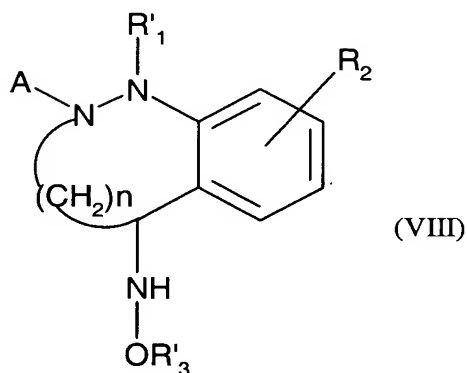
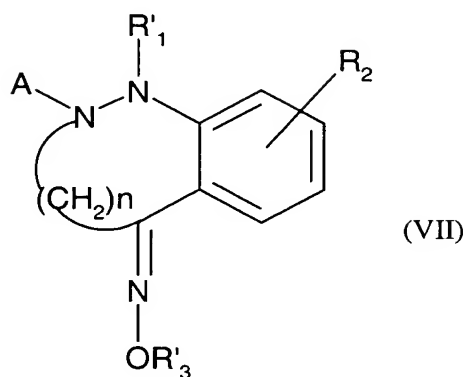
in which A, R₂ and n have the same meanings as in claim 13 and R'₁ is (CH₂)_{n'}R^o₁ in which n' is 0 or 1 and R^o₁ is selected from the group consisting of heteroaryl containing up to 15 carbon atoms and one or more heteroatoms selected from nitrogen, sulfur and oxygen, COR', CONR'R'', CSNR'R'', COCOOR', SO₂NR'R'', SO₂R', CO₂R' and CN, R' is hydrogen, alkyl or alkenyl containing up to 8 carbon atoms, aralkyl containing up to 12 carbon atoms or aryl containing up to 12 carbon atoms, and R'' is hydrogen, alkyl containing up to 8 carbon atoms, aryl containing up to 12 carbon atoms, aralkyl containing up to 12 carbon atoms, SO₂-R' or COR', R' being as defined above.

20) A compound of formula (VI) or one of its salts with an acid:



in which A, R'₁, R₂, B and n have the same meanings as in claim 13.

20 21) A compound of formula (VII) or (VIII) or one of its salts with an acid:



in which A, R₁, R₂, n and R₃ are as defined in claim 14.

5

22) A method of treating a bacterial infection in a mammal comprising administering to a mammal in need thereof an antibacterially effective amount of a compound of claim 1.

23) A method of treating an infection or infection-causing condition in a mammal that is due to the presence of bacteria that generate beta-lactamases, which comprises administering to a mammal in need thereof an amount of a compound of claim 1 that is effective to inhibit beta-lactamase in said mammal.

10